

SEQUENCE LISTING

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<110> Tavtigian, Sean V.
      Teng, David H.F.
      Simard, Jacques
      Rommens, Johanna M.
      Myriad Genetics, Inc.

<120> Chromosome 17p-Linked Prostate Cancer Susceptibility
      Gene and a Paralog and Orthologous Genes

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<150> US 60/107,468
<151> 1998-11-06

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<170> PatentIn Ver. 2.0

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Arg Lys Asp Pro Leu Arg His Leu Arg Thr Arg Glu Lys Arg Gly Pro
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 Arg Glu Leu Arg Gln Val Arg Ala Ala Leu Leu Ser Arg Glu Leu Ala
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 signal: 26447-26452

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Gly Arg Thr Ile Ser Gln Ala Pro Ala Arg Arg Glu Arg Pro Arg Lys
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Asp Pro Leu Arg His Leu Arg Thr Arg Glu Lys Arg Gly Pro Ser Gly
35 40 45 50

tgc tcc ggc ggc cca aac acc gtg tac ctg cag gtg gtg gca gcg ggt 248
Cys Ser Gly Gly Pro Asn Thr Val Tyr Leu Gln Val Val Ala Ala Gly
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agc cgg gac tcg ggc gcc gcg ctc tac gtc ttc tcc gag ttc aac 293
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Asn

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Gly Ser Ala Arg Arg Pro Arg Pro Pro Lys Asp Pro Leu Arg His Leu
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Arg Thr Arg Glu Lys Arg Gly Pro Gly Pro Gly Gly Pro Asn Thr Val
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Tyr Leu Gln Val Val Ala Ala Gly Gly Arg Asp Ala Gly Ala Ala Leu
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His Leu Arg Thr Arg Glu Lys Arg Gly Pro Gly Pro Gly Gly Pro Asn
35 40 45

Thr Val Tyr Leu Gln Val Val Ala Ala Gly Gly Arg Asp Ala Gly Ala
50 55 60

Ala Leu Tyr Val Phe Ser Glu Tyr Asn
65 70

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<220>
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 hydrophobic residue.

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<220>
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<220>
 <221> SITE
 <222> (11)..(12)
 <223> These can be any amino acid residues.

<400> 214
 Xaa Xaa Xaa Xaa His Xaa His Xaa Asp His Xaa Xaa Gly
 1 5 10

<210> 215
 <211> 127
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)..(127)
 <223> Exon 1.

<400> 215
 tttaatacga ctcaactatag ggaatttggc cctcgagnng aattcggcac gagggtagcc 60
 ccgcgcacagc tgggccgagg gtgcgggcct gcgcctccctc ggctcctggc gcgggctcgg 120
 ggagagg 127

<210> 216
 <211> 983
 <212> DNA
 <213> Homo sapiens

```
<220>
<221> intron
<222> (1)..(300)
<223> Intron upstream of exon 3.
```

<220>
 <221> misc_feature
 <222> (301)..(768)
 <223> Exon 3.

<220>
 <221> intron
 <222> (769)..(1287)
 <223> Intron downstream of exon 3.

<400> 217
 gtgagctatg atcacaccac tgcactccag cctggatgac agagcaagac ctgtctcttt 60
 aaaaaaaaaa aaactattaa aaacaaacaa acaaaaaacc acctggtgaa ataaagcctg 120
 tttttttgtt tttggaatca tgtagcaaaa tgtaaatgaa taagtttatg atgataagta 180
 gaacttttaa attcaattta ctatttttaa tgtaaatgtg taggcttgtt tcaaatagct 240
 ttgtatgggt ttttagttta tgaataattt ccaaacgtat ttctctatct caatcaaaag 300
 ggagaattac caagatcttc atcacacacc ttcatggaga ccattttctt ggccttctcg 360
 ggctcctctg cacaatcagc ctgcagagtg gtcctatggt gtccaacacg cctattgaaa 420
 tctatggccc tgtagggtct cgggaactta tctggcgaac catggaactc tctcacacgy 480
 agctggtctt ccattatgtg gttcatgaac tggttcctac agcagatcaa tgtcctgcag 540
 aagaactaaa agaatttgcg catgtgaata gagcagacag tcttcccaaa gaggaacaag 600
 gaagaactat cctgttagac tcagaagaaa actcatacct totgtttgat gatgaacaat 660
 ttgttgtaaa agcatttcgc ctctttcaca gaattccctc atttgggttt tcagtcgttg 720
 aaaaagaaacg ccaggttaaa ctcaatgcac agaaacttaa agaccttggt aagtgttttt 780
 ttgttttttg tttttcccg ccttctcctc aatagggtct ctgttgactg aagtataag 840
 aaatgtcata gtaaggccag gagttgtggc tcacgcctgt aatcctagca ctttgggag 900
 ccgaggtggg aggatcactt gagttcggga gttcaagacc agcctgggca acatggcgaa 960
 acccatctc tactaaaaat acaaaaagta actgggtgtg gtgtcatgtg cctgtagtcc 1020
 cagctacttg gggggtcgag gcaggaggat cacttgaacc tgggaggtca aggctgcagt 1080
 aagccaagat agtgttacta tactccagct tgggtgacaa agcgaaactc tgtctcaaaa 1140
 aaaaaaaagt gtcatagtaa gcttccactc ctctatccca ggcctgaaac tgacaatttc 1200
 tcaactagtc ctttgtccaa agttgtctta taagaaatcc atgggggccaa aaaaatgcta 1260
 tttagagcaa acccagtata cattga 1287

<210> 218
 <211> 1378
 <212> DNA
 <213> Homo sapiens

<220>
 <221> intron
 <222> (1)..(300)
 <223> Intron upstream of exon 4.

<220>
 <221> misc_feature
 <222> (301)..(966)
 <223> Exon 4 with CDS ending at 764.

<220>
 <221> intron
 <222> (967)..(1378)
 <223> Intron downstream of exon 4.

<400> 218
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 ggagactaaa acctgtctga catgtatgca tgggaaatgt ttcaagtact aaggcattgc 120
 taatatcaat caacactgaa attttaaaaa tgtataaatc cagttttcca caagtagtaa 180
 aacatttata acaattatgg atgccttttc cattagctat ttgcaatgct gttaaaaatag 240
 actcttgaaa agtcataaat tccattccta tgatgtaatg ttatctgcct tcatcattag 300
 gtgttcaccc aggtcctgcc tatgggaagc tgaaaaatgg aatttctgtt gttctggaaa 360
 atgggggttac aatttctccc caagatgtct taaaaaagcc tattgttgga agaaaaatct 420
 gcatattggg tgactgtctt ggggttggtg gtgatggagg agtaaaactg tgctttgaag 480
 cagacctgtt gatccacgaa gcaaccctgg atgatgocca gatggacaaa gcaaaggagc 540
 atggccacag cacaccacag atggcagcaa catttgcaaa gttgtgccgt gcaaaggagc 600
 tggttctgac tcacttcagt cagaggtaca aaccagtttg cttggccaga gaaggagaaa 660
 cagatggcat tgcagaacta aaaaagcaag ctgaatcagt gttagatctc caagaagtga 720
 ctctagcaga agattttatg gtgataagca ttccaatcaa gaaatgaaac cagtgttctt 780
 gagtgcacac tgacatgtct gtgaatatgt tactgaacct atagtcocgt ttttttattt 840
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 aaaaaaccca gcatcctttt tgaagtccag atttgcaaa atgatagact attcagttat 1020
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 ttctgccag ctttattgct gctattggca aagagcacag gactcagccc tcgtggctaa 1140
 aaatggtatt ttggcagttt gtattgaatc tgtttgtgtt attaacagaa gagggagaaa 1200
 tgtcatgaga cgttgagacg gcaggattga tgatagcatg accatagctt tgctggaata 1260
 ctgaatgcag ggtttggcta ggtgtttatt ttaacatctt attaaacttt ctatttgggt 1320
 cttaacccat ggttctcaac tggggtgaca ctgctcctct agaacaggtt gaaatatg 1378

<210> 219
 <211> 1462
 <212> DNA
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (136)..(1224)

<400> 219
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 ggagaggggt ggaag atg tct atg gat gtg aca ttc ctg ggg acg ggt gca 171
 Met Ser Met Asp Val Thr Phe Leu Gly Thr Gly Ala
 1 5 10
 gca tac cca tct cca acc cgg ggt gcc tct gct gtg gtc ctt cgg tgt 219
 Ala Tyr Pro Ser Pro Thr Arg Gly Ala Ser Ala Val Val Leu Arg Cys
 15 20 25
 gaa ggc gag tgc tgg ctc ttt gac tgt ggg gag gga aca cag aca cag 267
 Glu Gly Glu Cys Trp Leu Phe Asp Cys Gly Glu Gly Thr Gln Thr Gln
 30 35 40
 ctt atg aaa agc caa ctt aaa gca ggg aga att acc aag atc ttc atc 315
 Leu Met Lys Ser Gln Leu Lys Ala Gly Arg Ile Thr Lys Ile Phe Ile
 45 50 55 60
 aca cac ctt cat gga gac cat ttc ttt ggc ctt cct ggg ctc ctc tgc 363
 Thr His Leu His Gly Asp His Phe Phe Gly Leu Pro Gly Leu Leu Cys
 65 70 75
 aca atc agc ctg cag agt ggc tcc atg gtg tcc aaa cag cct att gaa 411
 Thr Ile Ser Leu Gln Ser Gly Ser Met Val Ser Lys Gln Pro Ile Glu
 80 85 90
 atc tat ggc cct gta ggg ctt cgg gac ttt atc tgg cga acc atg gaa 459
 Ile Tyr Gly Pro Val Gly Leu Arg Asp Phe Ile Trp Arg Thr Met Glu
 95 100 105
 ctc tct cac acg gag ctg gtc ttc cat tat gtg gtt cat gaa ctg gtt 507
 Leu Ser His Thr Glu Leu Val Phe His Tyr Val Val His Glu Leu Val
 110 115 120
 cct aca gca gat caa tgt cct gca gaa gaa cta aaa gaa ttt gcg cat 555
 Pro Thr Ala Asp Gln Cys Pro Ala Glu Glu Leu Lys Glu Phe Ala His
 125 130 135 140
 gtg aat aga gca gac agt cct ccc aaa gag gaa caa gga aga act atc 603
 Val Asn Arg Ala Asp Ser Pro Pro Lys Glu Glu Gln Gly Arg Thr Ile
 145 150 155
 ctg tta gac tca gaa gaa aac tca tac ctt ctg ttt gat gat gaa caa 651
 Leu Leu Asp Ser Glu Glu Asn Ser Tyr Leu Leu Phe Asp Asp Glu Gln
 160 165 170
 ttt gtt gta aaa gca ttt cgc ctc ttt cac aga att ccc tca ttt ggg 699
 Phe Val Val Lys Ala Phe Arg Leu Phe His Arg Ile Pro Ser Phe Gly
 175 180 185

0988687.12001

ttt tca gtc gtg gaa aag aaa cgc cca ggt aaa ctc aat gca cag aaa 747
 Phe Ser Val Val Glu Lys Lys Arg Pro Gly Lys Leu Asn Ala Gln Lys
 190 195 200

ctt aaa gac ctt ggt gtt cca cca ggt cct gcc tat ggg aag ctg aaa 795
 Leu Lys Asp Leu Gly Val Pro Pro Gly Pro Ala Tyr Gly Lys Leu Lys
 205 210 215 220

aat gga att tct gtt gtt ctg gaa aat ggg gtt aca att tct ccc caa 843
 Asn Gly Ile Ser Val Val Leu Glu Asn Gly Val Thr Ile Ser Pro Gln
 225 230 235

gat gtc tta aaa aag cct att gtt gga aga aaa atc tgc ata ttg ggt 891
 Asp Val Leu Lys Lys Pro Ile Val Gly Arg Lys Ile Cys Ile Leu Gly
 240 245 250

gac tgc tct ggg gtt gtg ggt gat gga gga gta aaa ctg tgc ttt gaa 939
 Asp Cys Ser Gly Val Val Gly Asp Gly Gly Val Lys Leu Cys Phe Glu
 255 260 265

gca gac ctg ttg atc cac gaa gca acc ctg gat gat gcc cag atg gac 987
 Ala Asp Leu Leu Ile His Glu Ala Thr Leu Asp Asp Ala Gln Met Asp
 270 275 280

aaa gca aag gag cat ggc cac agc aca cca cag atg gca gca aca ttt 1035
 Lys Ala Lys Glu His Gly His Ser Thr Pro Gln Met Ala Ala Thr Phe
 285 290 295 300

gca aag ttg tgc cgt gca aag agg ctg gtt ctg act cac ttc agt cag 1083
 Ala Lys Leu Cys Arg Ala Lys Arg Leu Val Leu Thr His Phe Ser Gln
 305 310 315

agg tac aaa cca gtt gcc ttg gcc aga gaa gga gaa aca gat ggc att 1131
 Arg Tyr Lys Pro Val Ala Leu Ala Arg Glu Gly Glu Thr Asp Gly Ile
 320 325 330

gca gaa cta aaa aag caa gct gaa tca gtg tta gat ctc caa gaa gtg 1179
 Ala Glu Leu Lys Lys Gln Ala Glu Ser Val Leu Asp Leu Gln Glu Val
 335 340 345

act cta gca gaa gat ttt atg gtg ata agc att cca atc aag aaa 1224
 Thr Leu Ala Glu Asp Phe Met Val Ile Ser Ile Pro Ile Lys Lys
 350 355 360

tgaaccaggt gttcctgagt gcacactgac atgtctgtga atatgttact gaacctatag 1284

tccagttttt ttattttcttg ttttagtctg aaattatttg ggccctaata atcctaaaaa 1344

gaatggagct gcattgatga attggctcag tattttaaagg gagcaaacctt ttgtataata 1404

aatcttttta agagaaaaaa aaaaaaaga aaaaaagatct ataattaagc aggggcat 1462

<210> 220
 <211> 363
 <212> PRT
 <213> Homo sapiens

<400> 220
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Trp	Leu	Phe 35	Asp	Cys	Gly	Glu	Gly 40	Thr	Gln	Thr	Gln	Leu 45	Met	Lys	Ser
Gln	Leu 50	Lys	Ala	Gly	Arg	Ile 55	Thr	Lys	Ile	Phe	Ile 60	Thr	His	Leu	His
Gly 65	Asp	His	Phe	Phe	Gly 70	Leu	Pro	Gly	Leu 75	Cys	Thr	Ile	Ser	Leu 80	
Gln	Ser	Gly	Ser	Met	Val 85	Ser	Lys	Gln	Pro 90	Ile	Glu	Ile	Tyr	Gly 95	Pro
Val	Gly	Leu 100	Asp	Phe	Ile	Trp	Arg 105	Thr	Met	Glu	Leu	Ser 110	His	Thr	
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Gln	Cys 130	Pro	Ala	Glu	Glu	Leu 135	Lys	Glu	Phe	Ala 140	His	Val	Asn	Arg	Ala
Asp 145	Ser	Pro	Pro	Lys	Glu 150	Glu	Gln	Gly	Arg	Thr 155	Ile	Leu	Leu	Asp	Ser 160
Glu	Glu	Asn	Ser	Tyr 165	Leu	Leu	Phe	Asp 170	Glu	Gln	Phe	Val 175	Val	Lys	
Ala	Phe	Arg 180	Leu	Phe	His	Arg	Ile 185	Pro	Ser	Phe	Gly	Phe 190	Ser	Val	Val
Glu	Lys	Lys 195	Arg	Pro	Gly	Lys	Leu 200	Asn	Ala	Gln	Lys	Leu 205	Lys	Asp	Leu
Gly 210	Val	Pro	Pro	Gly	Pro	Ala 215	Tyr	Gly	Lys	Leu 220	Lys	Asn	Gly	Ile	Ser
Val 225	Val	Leu	Glu	Asn	Gly 230	Val	Thr	Ile	Ser	Pro 235	Gln	Asp	Val	Leu	Lys 240
Lys	Pro	Ile	Val 245	Gly	Arg	Lys	Ile	Cys	Ile 250	Leu	Gly	Asp	Cys	Ser 255	Gly
Val	Val	Gly 260	Asp	Gly	Gly	Val	Lys	Leu 265	Cys	Phe	Glu	Ala 270	Asp	Leu	Leu
Ile	His 275	Glu	Ala	Thr	Leu	Asp 280	Ala	Gln	Met	Asp	Lys 285	Ala	Lys	Glu	
His	Gly 290	His	Ser	Thr	Pro	Gln 295	Met	Ala	Ala	Thr	Phe 300	Ala	Lys	Leu	Cys
Arg 305	Ala	Lys	Arg	Leu	Val 310	Leu	Thr	His	Phe	Ser 315	Gln	Arg	Tyr	Lys	Pro 320
Val	Ala	Leu	Ala	Arg 325	Glu	Gly	Glu	Thr	Asp 330	Gly	Ile	Ala	Glu	Leu	Lys 335
Lys	Gln	Ala 340	Glu	Ser	Val	Leu	Asp	Leu 345	Gln	Glu	Val	Thr	Leu 350	Ala	Glu

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Met	Trp	Ala	Leu	Arg	Ser	Leu	Leu	Arg	Pro	Leu	Gly	Leu	Arg	Thr	Met		48
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tcg	cag	ggt	tcg	gct	cgt	cgg	cgg	cgg	cca	ccc	aaa	gac	cca	ctg	cga		96
Ser	Gln	Gly	Ser	Ala	Arg	Arg	Pro	Arg	Pro	Pro	Lys	Asp	Pro	Leu	Arg		
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cac	ctg	cgt	acg	cgg	gag	aag	cgc	ggc	cgg	ggt	ccc	ggg	ggc	cgg	aac		144
His	Leu	Arg	Thr	Arg	Glu	Lys	Arg	Gly	Pro	Gly	Pro	Gly	Gly	Pro	Asn		
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acc	gtg	tac	ctg	cag	gtg	gtg	cgc	ggc	ggc	ggc	cgg	gac	gcg	ggg	gct		192
Thr	Val	Tyr	Leu	Gln	Val	Val	Gln	Ala	Gly	Gly	Arg	Asp	Ala	Gly	Ala		
	50					55					60						
gct	ctc	tat	gtc	ttc	tcg	gaa	tac	aac	agg	tac	ctt	ttt	aac	tgc	gga		240
Ala	Leu	Tyr	Val	Phe	Ser	Glu	Tyr	Asn	Arg	Tyr	Leu	Phe	Asn	Cys	Gly		
65					70					75					80		
gaa	ggc	gtc	caa	cga	ctt	atg	cag	gaa	cac	aag	act	gaa	agt	cgc	tcg		288
Glu	Gly	Val	Gln	Arg	Leu	Met	Gln	Glu	His	Lys	Thr	Glu	Ser	Arg	Ser		
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ctt	gac	aac	atc	ttt	ctg	act	cgg	atg	cat	tgg	tca	aat	gtt	ggg	ggg		336
Leu	Asp	Asn	Ile	Phe	Leu	Thr	Arg	Met	His	Trp	Ser	Asn	Val	Gly	Gly		
			100					105					110				
ttg	tgt	gga	atg	att	tta	act	tta	aag	gaa	acc	ggg	ctt	ccc	aaa	tgt		384
Leu	Cys	Gly	Met	Ile	Leu	Thr	Leu	Lys	Glu	Thr	Gly	Leu	Pro	Lys	Cys		
		115					120					125					
ctg	ctg	tct	gga	cga	cca	cag	ctg	gag	aaa	tat	cta	gaa	gca	atc	aaa		432
Val	Leu	Ser	Gly	Pro	Pro	Gln	Leu	Glu	Lys	Tyr	Leu	Glu	Ala	Ile	Lys		
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ata	ttt	tct	ggt	cca	ttg	aaa	gga	ata	gaa	ctg	gcc	gtg	cgg	cct	cac		480
Ile	Phe	Ser	Gly	Pro	Leu	Lys	Gly	Ile	Glu	Leu	Ala	Val	Arg	Pro	His		
145					150					155					160		
tct	gca	cca	gaa	tac	aag	gat	gag	acc	atg	act	gtt	tac	cag	gtc	cct		528
Ser	Ala	Pro	Glu	Tyr	Lys	Asp	Glu	Thr	Met	Thr	Val	Tyr	Gln	Val	Pro		
			165						170					175			
atc	cac	agt	gaa	cgg	agg	tgt	gga	aag	caa	cag	cca	tcc	cag	agc	ccc		576
Ile	His	Ser	Glu	Arg	Arg	Cys	Gly	Lys	Gln	Gln	Pro	Ser	Gln	Ser	Pro		
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aga aca tct ccc aac agg ctc agt ccc aaa cag tca tgc gac tct gga	624
Arg Thr Ser Pro Asn Arg Leu Ser Pro Lys Gln Ser Ser Asp Ser Gly	
195 200 205	
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Ser Ala Glu Asn Gly Gln Cys Gln Gln Glu Ser Met Gly Gln Gly Pro	
210 215 220	
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Ser Leu Val Val Ala Phe Val Cys Lys Leu His Leu Arg Lys Gly Asn	
225 230 235	
ttc ttg gtg ctt aaa gca aag gag ctg ggc ctt cct gtt ggg acg gcc	768
Phe Leu Val Leu Lys Ala Lys Glu Leu Gly Leu Pro Val Gly Thr Ala	
245 250 255	
gcc att gca ccc atc att gct gct gtc aag gac ggg aag agt atc act	816
Ala Ile Ala Pro Ile Ile Ala Ala Val Lys Asp Gly Lys Ser Ile Thr	
260 265 270	
tac gaa gga aga gag att gct gct gaa gag ctt tgt aca ccc cca gat	864
Tyr Glu Gly Arg Glu Ile Ala Ala Glu Glu Leu Cys Thr Pro Pro Asp	
275 280 285	
cct ggt ctt gta ttc atc gtg gta gag tgt cct gat gaa gga ttc atc	912
Pro Gly Leu Val Phe Ile Val Val Glu Cys Pro Asp Glu Gly Phe Ile	
290 295 300	
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Leu Pro Ile Cys Glu Asn Asp Thr Phe Lys Arg Tyr Gln Ala Glu Ala	
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gat gca cct gtg gcg ctg gtg gtc cac ata gcc cca gaa tct gta ctc	1008
Asp Ala Pro Val Arg Tyr Leu Val Val His Ile Ala Pro Glu Ser Val Leu	
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atc gac agc aga tac cag cag tgg atg gag agg ttc ggg cct gac aca	1056
Ile Asp Ser Arg Tyr Gln Gln Trp Met Glu Arg Phe Gly Pro Asp Thr	
340 345 350	
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Gln His Leu Ile Leu Asn Glu Asn Cys Pro Ser Val His Asn Leu Arg	
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Ser His Lys Ile Gln Thr Gln Leu Ser Ser Leu Ile His Pro Asp Ile Phe	
370 375 380	
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Pro Gln Leu Thr Ser Phe Tyr Ser Lys Glu Gly Ser Thr Leu Ser	
385 390 395 400	
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Val Pro Thr Val Arg Gly Glu Cys Leu Leu Lys Tyr Ser Val Arg Pro	
405 410 415	
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Lys Arg Glu Trp Gln Arg Asp Thr Thr Leu Asp Cys Asn Thr Asp Glu	
420 425 430	
ttc ata gct gag gcc ttg gag ctc ccc agt ttc cag gag agt gtg gag	1344
Phe Ile Ala Glu Ala Leu Glu Leu Pro Ser Phe Gln Glu Ser Val Glu	
435 440 445	

tat Tyr 450	cgg Arg	aag Lys	acc Asn	gtg Val	cag Gln 455	gaa Glu	aac Asn	cca Pro	gcc Ala	cca Ala 460	gca Ala	gag Glu	aaa Lys	aga Arg	1392	
agc Ser 465	cag Gln	tat Tyr	cct Pro	gaa Glu	att Ile 470	gtc Val	ttc Phe	ctg Leu	ggt Gly 475	acg Thr	ggg Gly	tct Ser	gcc Ala	atc Ile 480	cca Pro 480	1440
atg Met	gag Glu	atc Ile	cga Arg	aat Asn 485	gtc Val	agt Ser	tcc Ser	aca Thr	ctc Leu 490	gtc Val	aac Asn	cta Leu	agc Ser	cct Pro 495	gac Pro 495	1488
aag Lys	tca Ser	gtg Val	ctc Leu 500	ctg Leu	gat Asp	tgt Cys	gga Gly 505	gaa Glu	ggc Gly	act Thr	ttt Phe	ggg Gly	cag Gln 510	ttg Leu	tgc Cys	1536
cgt Arg	cat His	tac Tyr 515	gga Gly	cag Gln	caa Gln	ata Ile	gac Asp 520	cga Arg	gtc Val	tta Leu	tgc Cys 525	agc Ser	ctc Leu	acg Thr	gct Ala	1584
gtg Val	ttt Phe 530	gtg Val	tcc Ser	cac His	ctg Leu	cac His 535	gcc Ala	gac Asp	cac His	cac His	acg Thr 540	ggc Gly	ttg Leu	ctg Leu	aat Asn	1632
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cag Gln	tat Tyr	cac His	aac Asn 580	cac His	tgc Cys	cag Gln	gag Glu	att Ile 585	ctg Leu	cac His	cac His	gtc Val 590	agt Ser	atg Met	att Ile	1776
cct Pro	gcc Ala	aaa Lys 595	tgc Cys	ctt Leu	cag Gln	aaa Lys 600	ggg Gly	gca Ala	gag Glu	gtc Val 605	tcc Ser	aat Asn 610	act Thr	aca Thr	ttg Leu	1824
gaa Glu	agg Arg 610	ctg Leu	ata Ile	agc Ser	ttg Leu	ctg Leu 615	ttg Leu	gaa Glu	aca Thr	tgt Cys 620	gac Asp 625	tta Leu	gaa Glu	gaa Glu	ttt Phe	1872
cag Gln 625	acc Thr	tgc Cys	ctg Leu	gta Val	cgg Arg 630	cac His	tgc Cys	aag Lys	cat His	gct Ala 635	ttt Phe	ggc Gly	tgt Cys	gca Ala	ctg Leu 640	1920
gta Val	cat His	tca Ser	tct Ser	ggc Gly 645	tgg Trp	aaa Lys	gtc Val	gtc Val	tac Val 650	tcg Ser	ggg Gly	gat Asp	acc Thr	atg Met 655	ccc Pro	1968
tgt Cys	gag Glu	gct Ala	ctg Leu 660	gtc Val	cag Gln	atg Met	ggg Gly	aaa Lys 665	gat Asp	gcc Ala	acc Thr	ctc Leu 670	ctg Leu	ata Ile	cat His	2016
gaa Glu	gcc Ala	act Thr 675	ctg Leu	gag Glu	gat Asp	cnc Xaa	ttg Leu 680	gaa Glu	gag Glu	gaa Glu	gca Ala	gta Val 685	gag Glu	agg Arg	aca Thr	2064
cac His 690	agc Ser	acc Thr	acc Thr	tcc Ser	cag Gln	gct Ala 695	att Ile	aat Asn	gtg Val	ggg Gly 700	atg Met	cgg Met	atg Met	aat Asn	gcg Ala	2112

gag ttc atc atg cag aac cac ttc agt cag cgg tac gcn aag atc ccc Glu Phe Ile Met Leu Asn His Phe Ser Gln Arg Tyr Xaa Lys Ile Pro	2160 705 710 715 720
ctt ttc agc cct gac ttc aac gag aaa gtt ggc atc gcc ttt gac cac Leu Phe Ser Pro Asp Phe Asn Glu Lys Val Gly Ile Ala Phe Asp His	2208 725 730 735
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cca ctg aag gcc ctg ttt gca ggt gac att gaa gag atg gtg gaa cgc Pro Leu Lys Ala Leu Phe Ala Gly Asp Ile Glu Glu Met Val Glu Arg	2304 755 760 765
agg gag aag agg gag cta cgg ctg gtg cga gca gcc ctg ctg acc cag Arg Glu Lys Arg Glu Leu Arg Leu Val Arg Ala Ala Leu Leu Thr Gln	2352 770 775 780
cag gca gac agc cca gag gac aga gaa ccc caa cag aag cgg gcc cac Gln Ala Asp Ser Pro Glu Glu Asp Arg Glu Pro Gln Gln Lys Arg Ala His	2400 785 790 795 800
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Thr Val Tyr Leu Gln Val Val Ala Ala Gly Gly Arg Asp Ala Gly Ala 50 55 60	
Ala Leu Tyr Val Phe Ser Glu Tyr Asn Arg Tyr Leu Phe Asn Cys Gly 65 70 75 80	
Glu Gly Val Gln Arg Leu Met Gln Glu His Lys Thr Glu Ser Arg Ser 85 90 95	
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 Pro Gly Leu Val Phe Ile Val Val Glu Cys Pro Asp Glu Gly Phe Ile
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 Gln Ala Asp Ser Pro Glu Asp Arg Glu Pro Gln Gln Lys Arg Ala His
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Asn	Arg	Tyr	Leu	Phe	Asn	Cys	Gly	Glu	Gly	Ile	Gln	Arg	Leu	Met	Gln	
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Glu	His	Lys	Leu	Lys	Val	Ala	Arg	Leu	Asp	Asn	Ile	Phe	Leu	Thr	Arg	
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Ile	Glu	Leu	Ala	Val	Arg	Pro	His	Ser	Ala	Pro	Glu	Tyr	Glu	Asp	Glu	
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acc	atg	aca	gtt	tac	cag	atc	ccc	ata	cac	agt	gaa	cag	agg	agg	gga	576
Thr	Met	Thr	Val	Tyr	Gln	Ile	Pro	Ile	His	Ser	Glu	Gln	Arg	Arg	Gly	
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Ile	Glu	Leu	Ala	Val	Arg	Pro	His	Ser	Ala	Pro	Glu	Tyr	Glu	Asp	Glu
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Thr	Met	Thr	Val	Tyr	Gln	Ile	Pro	Ile	His	Ser	Glu	Gln	Arg	Arg	Gly
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Lys	His	Gln	Pro	Trp	Gln	Ser	Pro	Glu	Arg	Pro	Leu	Ser	Arg	Leu	Ser
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Pro	His	Gly	Val	Ser	Gln	Arg	Arg	Gly	Val	Arg	Asp	Ser	Ser	Leu	Val
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Leu	Lys	Ala	Lys	Glu	Met	Gly	Leu	Pro	Val	Gly	Thr	Ala	Ala	Ile	Ala
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Pro	Ile	Ile	Ala	Ala	Val	Lys	Asp	Gly	Lys	Ser	Ile	Thr	His	Glu	Gly
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Trp	Gln	Arg	Asp	Ala	Ile	Ile	Thr	Cys	Asn	Pro	Glu	Glu	Phe	Ile	Ile	
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Leu	Glu	Asp	Gly	Leu	Glu	Glu	Glu	Ala	Val	Glu	Lys	Thr	His	Ser	Thr	
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Asn Arg Tyr Leu Phe Asn Cys Gly Glu Gly Val Gln Arg Leu Met Gln	
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Glu His Lys Leu Leu Val Val Arg Leu Asp Asn Ile Phe Leu Thr Arg	
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atg cac tgg tct aat gtt ggg gcc tta agt gga atg att ctt act tta	384
Met His Trp Ser Asn Val Gly Gly Leu Ser Gly Met Ile Leu Thr Leu	
115 120 125	

gaa Lys	gaa Glu	acc Thr	ggg Gly	ctt Leu	cca Pro	aag Lys	tgt Cys	gta Val	ttt Leu	tct Ser	gga Pro	cct Pro	cca Pro	cag Gln	ctg Leu	432
gaa Glu	aaa Lys	tac Tyr	ctc Leu	gaa Glu	gca Ala	atc Ile	aaa Lys	ata Ile	ttt Phe	tct Ser	ggt Gly	cca Pro	ttg Leu	aaa Lys	gga Gly	480
ata Ile	gaa Glu	ctg Leu	gct Ala	gtg Val	cgg Arg	ccc Pro	cac His	tct Ser	gcc Ala	cca Pro	gaa Glu	tac Tyr	gag Glu	gat Asp	gaa Glu	528
acc Thr	atg Met	aca Thr	gtt Val	tac Tyr	cag Gln	atc Ile	ccc Pro	ata Ile	cac His	agt Ser	gaa Glu	cag Gln	agg Arg	agg Arg	gga Gly	576
agg Arg	cac His	caa Gln	cca Pro	tgg Trp	cag Gln	agt Ser	cca Pro	gaa Glu	agg Arg	cct Pro	ctc Leu	agc Ser	agg Arg	ctc Leu	agt Ser	624
cca Pro	gag Glu	cga Arg	tct Ser	tca Ser	gac Asp	tcc Ser	gag Glu	tcg Ser	aat Asn	gaa Glu	aat Asn	gag Glu	cca Pro	cac His	ctt Leu	672
cca Pro	cat His	ggt Gly	gtt Val	agc Ser	cag Gln	aga Arg	aga Arg	ggg Gly	gtc Val	agg Arg	gac Asp	tct Ser	tcc Ser	ctg Leu	gtc Val	720
gta Val	gct Ala	ttc Phe	atc Ile	tgt Cys	aag Lys	ctt Leu	cac His	tta Leu	aag Lys	aga Arg	gga Gly	aac Asn	ttc Phe	ttg Leu	gtg Val	768
ctc Leu	aaa Lys	gca Ala	aag Lys	gag Glu	atg Met	ggc Gly	ctc Leu	cca Pro	gtt Val	ggg Gly	aca Thr	gct Ala	gcc Ala	atc Ile	gct Ala	816
ccc Pro	atc Ile	att Ile	gct Ala	gct Ala	gtc Val	aag Lys	gac Asp	ggg Gly	aaa Lys	agc Ser	atc Ile	act Thr	cat His	gaa Glu	gga Gly	864
aga Arg	gag Glu	att Ile	ttg Leu	gct Ala	gaa Glu	gag Glu	ctg Leu	tgt Cys	act Thr	cct Pro	cca Pro	gat Asp	cct Pro	ggt Gly	gct Ala	912
gct Ala	ttt Phe	gtg Val	gtg Val	gta Val	gaa Glu	tgt Cys	cca Pro	gat Asp	gaa Glu	agc Ser	ttc Phe	att Ile	caa Gln	ccc Pro	atc Ile	960
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agg Arg	tac Tyr	cag Gln	cag Gln	tgg Trp	atg Met	gag Glu	agg Arg	ttt Phe	ggg Gly	cct Pro	gac Asp	acc Thr	cag Gln	cac His	ttg Leu	1104
gtc Val	ctg Leu	aat Asn	gag Glu	aac Asn	tgt Cys	gcc Ala	tca Ser	gtt Val	cac His	aac Asn	ctt Leu	cgc Arg	agc Ser	cac His	aag Lys	1152

acc 1le 385	caa Gln	acc Thr	cag Gln	ccc Leu	aac 390	ctc Leu	atc Ile	cac His	ccg Pro	gac 395	atc Ile	ttc Phe	ccc Pro	ctg Leu	ctc Asp 400	1200
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tgg Trp	cag Gln	agg Arg	gat Asp	gcc Ala	att Ile	atc Ile	act Thr	tgc Cys	aat Asn	cct Pro	gag Glu	gaa 445	ttc Phe	ata Ile	gtt Val	1344
gag Glu	gcg Ala	ctg Leu	cag Gln	ctt Leu	ccc Pro	aac Asn	ttc Phe	cag Gln	cag Gln	agt Ser	gtg Val	cag Gln	gag Glu	tac Tyr	agg Arg	1392
agg Arg	agt Ser	gtg Val	cag Gln	gac Asp	gtc Val	cca Pro	gcc Ala	cca Pro	gca Ala	gag Glu	aaa Lys	aga Arg	agt Ser	cag Gln	tac Tyr 480	1440
cca Pro	gaa Glu	atc Ile	atc Ile	ttc Phe 485	ctt Leu	gga Gly	aca Thr	ggg Gly	tct Ser	gcc Ala	atc Ile	ccc Pro	atg Met	aag Lys 495	att Ile	1488
cga Arg	aat Asn	gtc Val	agt Ser	gcc Ala	aca Thr	ctt Leu	gtc Val	aac 505	ata Ile	agc Ser	ccc Pro	gac Asp	acg Thr	tct Ser	ctg Leu 510	1536
cta Leu	ctg Leu	gac Asp 515	tgt Cys	ggc Gly	gag Glu	ggc Gly	acg Thr	ttt Phe	ggg Gly	cag Gln	ctg Leu	tgc Cys	cgt Ser	cat His	tac Tyr	1584
gga Gly	gac Asp 530	cag Gln	gtg Val	gac Asp	agg Arg	gtc Val	ctg Leu	ggc Gly	acc Thr	ctg Leu	gct Ala	gct Ala	gtg Val	ttt Phe	gtg Val	1632
tcc Ser	cac His	ctg Leu	cac His	gca Ala	gat Asp 550	cac His	cac His	acg His	ggc Gly	ttg Leu	cta Leu	aat Asn	atc Ile	ttg Leu	ctg Leu 560	1680
cag Gln	aga Arg	gaa Glu	caa Gln	gcc Ala 565	ttg Leu	gca Ala	tct Ser	ttg Leu	gga Gly	aag Lys	ccc Pro	ctt Leu	cac His	cct Pro	ttg Leu 575	1728
ctg Leu	gtg Val	gtt Val	gcc Ala 580	ccc Pro	agc Ser	cag Gln	ctc Leu	aaa Lys	gcc Ala	ttg Trp	ctc Leu	cag Gln	cag Gln	tac Tyr	cac His	1776
aac Asn	cag Gln	tgc Cys 595	cag Gln	gag Glu	gtc Val	ctg Leu	cac His	cac His	atc Ile	agt Ser	atg Met	att Ile	cct Pro	gcc Ala	aaa Lys	1824
tgc Cys	ctt Leu	cag Glu	gaa Glu	ggg Gly	gct Ala	gag Glu	atc Ile	tcc Ser	agt Ser	cct Pro	gca Val	gtg Ala	gaa Glu	aga Arg	ttg Leu	1872
atc Ile	agt Ser	tcg Ser	ttg Leu	cga Arg 630	aca Thr	tgt Cys	gat Asp	ttg Leu	gaa Glu	gag Glu	ttt Phe	cag Gln	acc Thr	tgt Cys	640	1920

ctg gtg cgg cac tgc aag cat gcg ttt ggc tgt gcg ctg gtg cac acc 1968
 Leu Val Arg His Cys Lys His Ala Phe Gly Cys Ala Leu Val His Thr
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tct ggc tgg aaa gtg gtc tat tcc ggg gac acc atg ccc tgc gag gct 2016
 Ser Gly Trp Lys Val Val Tyr Ser Gly Asp Thr Met Pro Cys Glu Ala
 660 665 670

ctg gtc cgc atg ggg aaa gat gcc acc ctc ctg ata cat gaa gcc acc 2064
 Leu Val Arg Met Gly Lys Asp Ala Thr Leu Leu Ile His Glu Ala Thr
 675 680 685

ctg gaa gat ggt ttg gaa gag gaa gca gtg gaa aag aca cac agc aca 2112
 Leu Glu Asp Gly Leu Glu Glu Glu Ala Val Glu Lys Thr His Ser Thr
 690 695 700

acg tcc caa gcc atc agc gtg ggg atg cgg atg aac gcg gag ttc att 2160
 Thr Ser Gln Ala Ile Ser Val Gly Met Arg Met Asn Ala Glu Phe Ile
 705 710 715 720

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 Met Leu Asn His Phe Ser Gln Arg Tyr Ala Lys Val Pro Leu Phe Ser
 725 730 735

ccc aac ttc aac gag aaa gtg gga gtt gcc ttt gac cac atg aag gtc 2256
 Pro Asn Phe Asn Glu Lys Val Gly Val Ala Phe Asp His Met Lys Val
 740 745 750

tgc ttt gga gac ttt cca aca atg ccc aag ctg att ccc cca ctg aaa 2304
 Cys Phe Gly Asp Phe Pro Thr Met Pro Lys Leu Ile Pro Pro Leu Lys
 755 760 765

gcc ctg ttt gcc ggc gac atc gag gag atg gag gag cgc agg gag aag 2352
 Ala Leu Phe Ala Gly Asp Ile Glu Glu Met Glu Glu Arg Arg Glu Lys
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cgg gag ctg cgg cag gtg cgg gcg gcc ctc ctg tcc ggg gag ctg gca 2400
 Arg Glu Leu Arg Gln Val Arg Ala Ala Leu Leu Ser Gly Glu Leu Ala
 785 790 795 800

ggc ggc ctg gag gat ggg gag cct cag cag aaa cgg gcc cac aca gag 2448
 Gly Gly Leu Glu Asp Gly Glu Pro Gln Gln Lys Arg Ala His Thr Glu
 805 810 815

gag cca cag gcc aag aag gtc aga gcc cag tgaagatctg ggagaccctg 2498
 Glu Pro Gln Ala Lys Lys Val Arg Ala Gln
 820 825

aattcagaag gctgtgtgtc ttctgcccc cgcacgcacc cgtatctgcc ctccttgctg 2558

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Arg Lys Asp Pro Leu Arg His Leu Arg Thr Arg Glu Lys Arg Gly Pro
      35              40              45

Ser Gly Cys Ser Gly Gly Pro Asn Thr Val Tyr Leu Gln Val Val Ala
      50              55              60

Ala Gly Ser Arg Asp Ser Gly Ala Ala Leu Tyr Val Phe Ser Glu Phe
      65              70              75              80

Asn Arg Tyr Leu Phe Asn Cys Gly Glu Gly Val Gln Arg Leu Met Gln
      85              90              95

Glu His Lys Leu Lys Val Val Arg Leu Asp Asn Ile Phe Leu Thr Arg
      100             105             110

Met His Trp Ser Asn Val Gly Gly Leu Ser Gly Met Ile Leu Thr Leu
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Lys Glu Thr Gly Leu Pro Lys Cys Val Leu Ser Gly Pro Pro Gln Leu
      130             135             140

Glu Lys Tyr Leu Glu Ala Ile Lys Ile Phe Ser Gly Pro Leu Lys Gly
      145             150             155             160

Ile Glu Leu Ala Val Arg Pro His Ser Ala Pro Glu Tyr Glu Asp Glu
      165             170             175

Thr Met Thr Val Tyr Gln Ile Pro Ile His Ser Glu Gln Arg Arg Gly
      180             185             190

Arg His Gln Pro Trp Gln Ser Pro Glu Arg Pro Leu Ser Arg Leu Ser
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Pro Glu Arg Ser Ser Asp Ser Glu Ser Asn Glu Asn Glu Pro His Leu
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Pro His Gly Val Ser Gln Arg Arg Gly Val Arg Asp Ser Ser Leu Val
      225             230             235             240

Val Ala Phe Ile Cys Lys Leu His Leu Lys Arg Gly Asn Phe Leu Val
      245             250             255

Leu Lys Ala Lys Glu Met Gly Leu Pro Val Gly Thr Ala Ala Ile Ala
      260             265             270

Pro Ile Ile Ala Ala Val Lys Asp Gly Lys Ser Ile Thr His Glu Gly
      275             280             285

Arg Glu Ile Leu Ala Glu Glu Leu Cys Thr Pro Pro Asp Pro Gly Ala
      290             295             300
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09986587-112001

Ala Phe Val Val Val Glu Cys Pro Asp Glu Ser Phe Ile Gln Pro Ile
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 Cys Glu Asn Ala Thr Phe Gln Arg Tyr Gln Gly Lys Ala Asp Ala Pro
 325 330 335
 Val Ala Leu Val Val His Met Ala Pro Glu Ser Val Leu Val Asp Ser
 340 345 350
 Arg Tyr Gln Gln Trp Met Glu Arg Phe Gly Pro Asp Thr Gln His Leu
 355 360 365
 Val Leu Asn Glu Asn Cys Ala Ser Val His Asn Leu Arg Ser His Lys
 370 375 380
 Ile Gln Thr Gln Leu Asn Leu Ile His Pro Asp Ile Phe Pro Leu Leu
 385 390 395 400
 Thr Ser Phe Pro Cys Lys Lys Glu Gly Pro Thr Leu Ser Val Pro Met
 405 410 415
 Val Gln Gly Glu Cys Leu Leu Lys Tyr Gln Leu Arg Pro Arg Arg Glu
 420 425 430
 Trp Gln Arg Asp Ala Ile Ile Thr Cys Asn Pro Glu Glu Phe Ile Val
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 Glu Ala Leu Gln Leu Pro Asn Phe Gln Gln Ser Val Gln Glu Tyr Arg
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 Arg Ser Val Gln Asp Val Pro Ala Pro Ala Glu Lys Arg Ser Gln Tyr
 465 470 475 480
 Pro Glu Ile Ile Phe Leu Gly Thr Gly Ser Ala Ile Pro Met Lys Ile
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 Leu Leu Asp Cys Gly Glu Gly Thr Phe Gly Gln Leu Cys Arg His Tyr
 515 520 525
 Gln Asp Gln Val Asp Arg Val Leu Gly Thr Leu Ala Ala Val Phe Val
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 Ser His Leu His Ala Asp His His Thr Gly Leu Leu Asn Ile Leu Leu
 545 550 555 560
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 565 570 575
 Leu Val Val Ala Pro Ser Gln Leu Lys Ala Trp Leu Gln Gln Tyr His
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 Asn Gln Cys Gln Glu Val Leu His His Ile Ser Met Ile Pro Ala Lys
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 Cys Leu Gln Glu Gly Ala Glu Ile Ser Ser Pro Ala Val Glu Arg Leu
 610 615 620
 Ile Ser Ser Leu Leu Arg Thr Cys Asp Leu Glu Glu Phe Gln Thr Cys
 625 630 635 640

Val Leu Gly Asn Gly Thr Gly Leu Leu Arg Ala Cys Phe Ile Leu Arg
100 105 110

Thr Pro Leu Lys Thr Tyr Met Phe Asn Cys Pro Glu Asn Ala Cys Arg
 115 120 125
 Phe Leu Trp Gln Leu Arg Ile Arg Ser Ser Ser Val Val Asp Leu Phe
 130 135 140
 Ile Thr Ser Ala Asn Trp Asp Asn Ile Ala Gly Ile Ser Ser Ile Leu
 145 150 155 160
 Leu Ser Lys Glu Ser Asn Ala Leu Ser Thr Arg Leu His Gly Ala Met
 165 170 175
 Asn Ile Lys His Phe Leu Glu Cys Ile Arg Pro Phe Gln Asp Ser Asp
 180 185 190
 Tyr Gly Ser Cys Lys Tyr Pro Ser Gln Val Glu Glu Arg Pro Tyr Thr
 195 200 205
 Met Glu Asn Tyr Glu Asp Ala Gly Leu Lys Val Thr Tyr Ile Pro Leu
 210 215 220
 Ser Pro Pro Leu Asn Ile Gly Ser Asn Asn Glu Lys Ser Lys Asn Val
 225 230 235 240
 Lys Val Asn Asn Val Asp Ile Ala Phe Leu Ile Glu Met Lys Glu Ala
 245 250 255
 Ala Arg Arg Ile Asp Thr Met Lys Leu Met Glu Leu Lys Val Pro Lys
 260 265 270
 Gly Pro Leu Ile Gly Lys Leu Lys Ser Gly Glu Ala Val Thr Leu Pro
 275 280 285
 Asp Gly Arg Thr Ile Gln Pro Asp Gln Val Phe Ser Ser Asp Lys Val
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 Glu Gly Asp Lys Pro Leu Leu Val Thr Glu Cys Thr Thr Glu Asp
 305 310 315 320
 His Val Lys Ala Leu Ile Asp Ser Ser Ser Leu Gln Pro Phe Leu Asn
 325 330 335
 Gly Glu Lys Gln Leu Asp Tyr Met Val His Ile Ser Asp Asp Ala Val
 340 345 350
 Ile Asn Thr Pro Thr Tyr Arg His Leu Met Glu Lys Leu Asn Asn Pro
 355 360 365
 Ser Ile Thr His Leu Leu Ile Asn Gly Gly Asn Pro Val Ile Pro Ala
 370 375 380
 Val Glu Ser Val Tyr Lys His Thr Arg Leu Leu Arg Ser Ile Ala Pro
 385 390 395 400
 Ser Leu Phe Pro Ala Leu His Pro Ile Asp Trp Ser Gly Ile Thr
 405 410 415
 Gln Asn Glu Glu Leu Ser Gln Arg Gln Asp Gln Phe Ile Arg Val Ala
 420 425 430
 Pro Met Gln Arg Tyr Trp Met Arg Arg Gly Ala Ser Phe Asn Glu Glu
 435 440 445

0988687-14004

Ala Arg Tyr Pro Lys Val Pro Val Leu Pro Glu Tyr Leu Asp Lys Gl
770 775 780

Lys Val Phe Gly Val Lys Pro Gly Pro Lys Tyr Ser Arg Leu Gln Ser
225 230 235 240

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Asp	Val	Met	Gly	Pro	Ser	Leu	Pro	Gly	Pro	Ile	Val	Leu	Leu	Val	Asp	
			260					265					270			
Cys	Pro	Thr	Glu	Ser	His	Ala	Ala	Glu	Leu	Phe	Ser	Leu	Lys	Ser	Leu	
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Glu	Ser	Tyr	Tyr	Ser	Ser	Pro	Asp	Glu	Gln	Thr	Ile	Gly	Ala	Lys	Phe	
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Val	Asn	Cys	Ile	Ile	His	Leu	Ser	Pro	Ser	Ser	Val	Thr	Ser	Ser	Pro	
					310					315					320	
Thr	Tyr	Gln	Ser	Trp	Met	Lys	Lys	Phe	His	Leu	Thr	Gln	His	Ile	Leu	
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Ala	Gly	His	Gln	Arg	Phe	Leu	Pro	Leu	Leu	Ile	Ile	Val	Ser	His	Gln	
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Lys	Thr	Val	Arg	Lys	Asn	Met	Ala	Phe	Pro	Ile	Leu	Lys	Ala	Ser	Ser	
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Arg	Ile	Ala	Ala	Arg	Leu	Asn	Tyr	Leu	Cys	Pro	Gln	Phe	Phe	Pro	Ala	
						375					380					
Pro	Gly	Phe	Trp	Pro	Ser	Gln	Leu	Thr	Asp	Asn	Ser	Ile	Ile	Asp	Pro	
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Thr	Pro	Ser	Asn	Lys	Phe	Asn	Leu	Arg	Pro	Val	Ala	Ile	Arg	Gly	Ile	
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Asp	Arg	Ser	Cys	Ile	Pro	Ala	Pro	Leu	Thr	Ser	Ser	Glu	Val	Val	Asp	
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Glu	Leu	Leu	Ser	Glu	Ile	Pro	Glu	Ile	Lys	Asp	Lys	Ser	Glu	Glu	Ile	
							440					445				
Lys	Gln	Phe	Trp	Asn	Lys	Gln	His	Asn	Lys	Thr	Ile	Ile	Glu	Lys	Leu	
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Trp	Leu	Ser	Glu	Cys	Asn	Thr	Val	Leu	Pro	Asn	Cys	Leu	Glu	Lys	Ile	
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Arg	Arg	Asp	Asp	Met	Glu	Ile	Val	Ile	Leu	Gly	Thr	Gly	Ser	Ser	Gln	
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Pro	Ser	Lys	Tyr	Arg	Asn	Val	Ser	Ala	Ile	Phe	Ile	Asp	Leu	Phe	Ser	
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Arg	Gly	Ser	Leu	Leu	Leu	Asp	Cys	Gly	Glu	Gly	Thr	Leu	Gly	Gln	Leu	
							520					525				
Lys	Arg	Arg	Tyr	Gly	Leu	Asp	Gly	Ala	Asp	Glu	Ala	Val	Arg	Lys	Leu	
						535					540					
Arg	Cys	Ile	Trp	Ile	Ser	His	Ile	His	Ala	Asp	His	His	Thr	Gly	Leu	
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Ala	Arg	Ile	Leu	Ala	Leu	Arg	Ser	Lys	Leu	Leu	Lys	Gly	Val	Thr	His	
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Glu Pro Val Ile Val Val Gly Pro Arg Pro Leu Lys Arg Phe Leu Asp
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 Ala Tyr Gln Arg Leu Glu Asp Leu Asp Met Glu Phe Leu Asp Cys Arg
 595 600 605
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 Glu Gly Ser Leu Phe Thr Gln Gly Ser Pro Met Gln Ser Val Phe Lys
 625 630 635 640
 Arg Ser Asp Ile Ser Met Asp Asn Ser Ser Val Leu Leu Cys Leu Lys
 645 650 655
 Asn Leu Lys Lys Val Leu Ser Glu Ile Gly Leu Asn Asp Leu Ile Ser
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 Phe Pro Val Val His Cys Pro Gln Ala Tyr Gly Val Val Ile Lys Ala
 675 680 685
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 Val Tyr Ser Gly Asp Ser Arg Pro Cys Pro Glu Thr Val Glu Ala Ser
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 Arg Asp Ala Thr Ile Leu Ile His Glu Ala Thr Phe Glu Asp Ala Leu
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 Ile Glu Glu Ala Leu Ala Lys Asn His Ser Thr Thr Lys Glu Ala Ile
 740 745 750
 Asp Val Gly Ser Ala Ala Asn Val Tyr Arg Ile Val Leu Thr His Phe
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 Ser Gln Arg Tyr Pro Lys Ile Pro Val Ile Asp Glu Ser His Met His
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 His Val Leu Pro Lys Val Leu Pro Tyr Phe Lys Thr Leu Phe Arg Asp
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Ile	Ser	Lys	Leu	Lys	Asp	Ile	Phe	Leu	Thr	Gly	Glu	Leu	Asn	Trp	Ser
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Asp	Ile	Gly	Gly	Leu	Pro	Gly	Met	Ile	Leu	Thr	Ile	Ala	Asp	Gln	Gly
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Lys	Ser	Asn	Leu	Val	Leu	His	Tyr	Gly	Asn	Asp	Ile	Leu	Asn	Tyr	Ile
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Val	Ser	Thr	Trp	Arg	Tyr	Phe	Val	Phe	Arg	Phe	Gly	Ile	Asp	Leu	Asn
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Asp	His	Ile	Met	Lys	Asp	Lys	Glu	Val	Tyr	Lys	Asp	Lys	Ile	Ile	Ala
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Val	Lys	Ser	Phe	Asn	Val	Leu	Lys	Asn	Gly	Gly	Glu	Asp	Arg	Leu	Gly
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Val	Phe	Asp	Ser	Phe	Gln	Lys	Gly	Val	Leu	Arg	Ser	Ile	Val	Ala	Lys
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Met	Phe	Pro	Lys	His	Ala	Pro	Thr	Asp	Arg	Tyr	Asp	Pro	Ser	Ser	Asp
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Pro	His	Leu	Asn	Val	Glu	Leu	Pro	Asp	Leu	Asp	Ala	Lys	Val	Glu	Val
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Ser	Thr	Asn	Tyr	Glu	Ile	Ser	Phe	Ser	Pro	Val	Arg	Gly	Lys	Phe	Lys
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Val	Glu	Glu	Ala	Ile	Lys	Leu	Gly	Val	Pro	Lys	Gly	Pro	Leu	Phe	Ala
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Lys	Leu	Thr	Lys	Gly	Gln	Thr	Ile	Thr	Leu	Asp	Asn	Gly	Ile	Val	Val
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		275					280					285			
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Lys	Ile	Ser	Pro	Asn	Thr	Ile	Ser	Phe	Phe	Gly	Ser	Ala	Leu	Thr	Thr
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Leu	Lys	Leu	Lys	Ala	Leu	Gln	Val	Asn	Asn	Tyr	Asn	Leu	Pro	Lys	Thr
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Ile	Ile	Glu	Lys	Asp	Asn	Ile	His	Ile	Phe	Ser	Gln	Asn	Lys	Thr	Val
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Thr	Phe	Glu	Pro	Phe	Arg	Met	Asn	Glu	Glu	Pro	Met	Lys	Cys	Asn	Ile
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			420					425					430		
Val	Lys	Pro	Leu	Glu	Phe	Pro	Leu	Ala	Asp	Val	Asp	Thr	Val	Ile	Asn
		435					440					445			
Asn	Gln	Leu	His	Val	Asp	Asn	Phe	Asn	Asn	Ser	Ala	Glu	Lys	Lys	Lys
450						455					460				
His	Val	Glu	Ile	Ile	Thr	Leu	Gly	Thr	Gly	Ser	Ala	Leu	Pro	Ser	Lys
465					470					475					480
Tyr	Arg	Asn	Val	Val	Ser	Thr	Leu	Val	Lys	Val	Pro	Phe	Thr	Asp	Ala
				485					490					495	
Asp	Gly	Asn	Thr	Ile	Asn	Arg	Asn	Ile	Met	Leu	Asp	Ala	Gly	Glu	Asn
			500					505					510		
Thr	Leu	Gly	Thr	Ile	His	Arg	Met	Phe	Ser	Gln	Leu	Ala	Val	Lys	Ser
		515					520					525			
Ile	Phe	Gln	Asp	Leu	Lys	Met	Ile	Tyr	Leu	Ser	His	Leu	His	Ala	Asp
530						535					540				
His	His	Leu	Gly	Ile	Ile	Ser	Val	Leu	Asn	Glu	Trp	Tyr	Lys	Tyr	Asn
545					550					555					560
Lys	Asp	Asp	Glu	Thr	Ser	Tyr	Ile	Tyr	Val	Val	Thr	Pro	Trp	Gln	Tyr
				565					570					575	
His	Lys	Phe	Val	Asn	Glu	Trp	Leu	Val	Leu	Glu	Asn	Lys	Glu	Ile	Leu
			580					585					590		
Lys	Arg	Ile	Lys	Tyr	Ile	Ser	Cys	Glu	His	Phe	Ile	Asn	Asp	Ser	Phe
			595				600					605			
Val	Arg	Met	Gln	Thr	Gln	Ser	Val	Pro	Leu	Ala	Glu	Phe	Asn	Glu	Ile
					615						620				
Leu	Lys	Glu	Asn	Ser	Asn	Gln	Glu	Ser	Asn	Arg	Lys	Leu	Glu	Leu	Asp
625					630					635					640
Arg	Asp	Ser	Ser	Tyr	Arg	Asp	Val	Asp	Leu	Ile	Arg	Gln	Met	Tyr	Glu
				645					650					655	
Asp	Leu	Ser	Ile	Glu	Tyr	Phe	Gln	Thr	Cys	Arg	Ala	Ile	His	Cys	Asp
			660					665					670		
Trp	Ala	Tyr	Ser	Asn	Ser	Ile	Thr	Phe	Arg	Met	Asp	Glu	Asn	Asn	Glu
						680						685			
His	Asn	Thr	Phe	Lys	Val	Ser	Tyr	Ser	Gly	Asp	Thr	Arg	Pro	Asn	Ile
690						695					700				

Leu Glu His Pro Leu Glu Cys Tyr Gly Tyr Arg Ile Glu Glu His Asp
145 150 155 160

Tyr Gly Tyr Arg Val Glu Glu Lys Gln Arg Pro Gly Arg Phe Asn Val
 145 150 155 160
 Glu Gln Ala Glu Ala Leu Gly Ile Pro Phe Gly Pro Ile Tyr Gly Gln
 165 170 175
 Leu Lys Gln Gly Lys Thr Val Thr Leu Glu Asp Gly Arg Arg Ile Arg
 180 185 190
 Gly Gln Asp Leu Cys Glu Pro Pro Glu Pro Gly Arg Lys Phe Val Tyr
 195 200 205
 Cys Thr Asp Thr Val Phe Cys Glu Glu Ala Ile Ala Leu Ala Gln Glu
 210 215 220
 Ala Asp Leu Leu Val His Glu Ala Thr Phe Ala His Gln Asp Ala Gln
 225 230 235 240
 Leu Ala Phe Asp Arg Leu His Ser Thr Ser Thr Met Ala Ala Gln Val
 245 250 255
 Ala Leu Leu Ala Asn Val Lys Gln Leu Ile Met Thr His Phe Ser Pro
 260 265 270
 Arg Tyr Ala Pro Gly Asn Pro Leu Gln Leu Glu Asn Leu Ala Glu
 275 280 285
 Ala Gln Ala Ile Phe Pro Asn Thr Arg Leu Ala Arg Asp Phe Leu Thr
 290 295 300
 Val Glu Ile Pro Arg Arg Thr Ala Asp Pro Ala Ile Ala Met Ser Thr
 305 310 315 320
 Pro Gln Ala Ser Pro Ala
 325

<210> 232
 <211> 307
 <212> PRT
 <213> Methanobacterium thermoautotrophicum

<400> 232
 Met Met Glu Val Thr Phe Leu Gly Thr Ser Ser Ala Val Pro Ser Lys
 1 5 10 15
 Asn Arg Asn His Thr Ser Ile Ala Leu Arg Ile Pro Gly Glu Ile Phe
 20 25 30
 Leu Phe Asp Cys Gly Glu Gly Thr Gln Arg Gln Met Ala Leu Ala Gly
 35 40 45
 Ile Ser Pro Met Lys Val Thr Arg Ile Phe Ile Thr His Leu His Gly
 50 55 60
 Asp His Ile Leu Gly Ile Pro Gly Met Ile Gln Ser Met Gly Phe Arg
 65 70 75 80
 Gly Arg Glu Glu Pro Leu Asp Ile Tyr Gly Pro Pro Gly Ile His Glu
 85 90 95
 Leu His Glu Cys Ile Met Lys Met Gly Tyr Phe Thr Leu Asp Phe Asp
 100 105 110

100211-28988660

Pro Trp Phe Leu Gln Lys Thr Ser Phe Lys Gly Arg Thr Phe Met Thr
85 90 95

His	Ala	Thr	Lys	Ala	Ile	Tyr	Arg	Trp	Leu	Leu	Ser	Asp	Tyr	Val	Lys
			100					105					110		
Val	Ser	Asn	Ile	Ser	Ala	Asp	Asp	Met	Leu	Tyr	Thr	Glu	Thr	Asp	Leu
		115					120					125			
Glu	Glu	Ser	Met	Asp	Lys	Ile	Glu	Thr	Ile	Asn	Phe	His	Glu	Val	Lys
		130				135					140				
Glu	Val	Ala	Gly	Ile	Lys	Phe	Trp	Cys	Tyr	His	Ala	Gly	His	Val	Leu
145					150					155					160
Gly	Ala	Ala	Met	Phe	Met	Ile	Glu	Ile	Ala	Gly	Val	Lys	Leu	Leu	Tyr
				165					170					175	
Thr	Gly	Asp	Phe	Ser	Arg	Gln	Glu	Asp	Arg	His	Leu	Met	Ala	Ala	Glu
		180						185					190		
Ile	Pro	Asn	Ile	Lys	Pro	Asp	Ile	Leu	Ile	Ile	Glu	Ser	Thr	Tyr	Gly
		195				200						205			
Thr	His	Ile	His	Glu	Lys	Arg	Glu	Glu	Arg	Glu	Ala	Arg	Phe	Cys	Asn
	210					215					220				
Thr	Val	His	Asp	Ile	Val	Asn	Arg	Gly	Gly	Arg	Gly	Leu	Ile	Pro	Val
225					230					235					240
Phe	Ala	Leu	Gly	Arg	Ala	Gln	Glu	Leu	Leu	Leu	Ile	Leu	Asp	Glu	Tyr
				245					250					255	
Trp	Gln	Asn	His	Pro	Glu	Leu	His	Asp	Ile	Pro	Ile	Tyr	Tyr	Ala	Ser
			260					265					270		
Ser	Leu	Ala	Lys	Lys	Cys	Met	Ala	Val	Tyr	Gln	Thr	Tyr	Val	Asn	Ala
		275					280					285			
Met	Asn	Asp	Lys	Ile	Arg	Lys	Gln	Ile	Asn	Ile	Asn	Asn	Pro	Phe	Val
	290					295					300				
Phe	Lys	His	Ile	Ser	Asn	Leu	Lys	Ser	Met	Asp	His	Phe	Asp	Asp	Ile
305					310					315					320
Gly	Pro	Ser	Val	Val	Met	Ala	Ser	Pro	Gly	Met	Met	Gln	Ser	Gly	Leu
				325					330					335	
Ser	Arg	Glu	Leu	Phe	Glu	Ser	Trp	Cys	Thr	Asp	Lys	Arg	Asn	Gly	Val
			340					345					350		
Ile	Ile	Ala	Gly	Tyr	Cys	Val	Glu	Gly	Thr	Leu	Ala	Lys	His	Ile	Met
		355					360					365			
Ser	Glu	Pro	Glu	Glu	Ile	Thr	Thr	Met	Ser	Gly	Gln	Lys	Leu	Pro	Leu
	370					375					380				
Lys	Met	Ser	Val	Asp	Tyr	Ile	Ser	Phe	Ser	Ala	His	Thr	Asp	Tyr	Gln
385				390						395					400
Gln	Thr	Ser	Glu	Phe	Ile	Arg	Ala	Leu	Lys	Pro	Pro	His	Val	Ile	Leu
				405					410					415	
Val	His	Gly	Glu	Gln	Asn	Glu	Met	Ala	Arg	Leu	Lys	Ala	Ala	Leu	Ile
		420						425					430		

Val Gly Arg Ser Cys Val Tyr Met Ser Phe Arg Gly Lys Asn Ile Leu
35 40 45

Tyr	Asp	Cys	Gly	Ile	His	Pro	Ala	Tyr	Ser	Gly	Met	Ala	Ala	Leu	Pro
50						55					60				
Tyr	Phe	Asp	Glu	Ile	Asp	Pro	Ser	Ser	Ile	Asp	Val	Leu	Leu	Ile	Thr
65					70					75					80
His	Phe	His	Ile	Asp	His	Ala	Ala	Ser	Leu	Pro	Tyr	Phe	Leu	Glu	Lys
				85					90					95	
Thr	Thr	Phe	Asn	Gly	Arg	Val	Phe	Met	Thr	His	Ala	Thr	Lys	Ala	Ile
			100					105					110		
Tyr	Lys	Leu	Leu	Leu	Thr	Asp	Tyr	Val	Lys	Val	Ser	Lys	Val	Ser	Val
		115					120					125			
Glu	Asp	Met	Leu	Phe	Asp	Glu	Gln	Asp	Ile	Asn	Lys	Ser	Met	Asp	Lys
		130				135					140				
Ile	Glu	Val	Ile	Asp	Phe	His	Gln	Thr	Val	Glu	Val	Asn	Gly	Ile	Lys
145					150					155					160
Phe	Trp	Cys	Tyr	Thr	Ala	Gly	His	Val	Leu	Gly	Ala	Ala	Met	Phe	Met
				165					170					175	
Val	Asp	Ile	Ala	Gly	Val	Arg	Ile	Leu	Tyr	Thr	Gly	Asp	Tyr	Ser	Arg
			180					185					190		
Glu	Glu	Asp	Arg	His	Leu	Arg	Ala	Ala	Glu	Leu	Pro	Gln	Phe	Ser	Pro
		195					200					205			
Asp	Ile	Cys	Ile	Ile	Glu	Ser	Thr	Ser	Gly	Val	Gln	Leu	His	Gln	Ser
		210				215					220				
Arg	His	Ile	Arg	Glu	Lys	Arg	Phe	Thr	Asp	Val	Ile	His	Ser	Thr	Val
225					230					235					240
Ala	Gln	Gly	Gly	Arg	Val	Leu	Ile	Pro	Ala	Phe	Ala	Leu	Gly	Arg	Ala
				245					250					255	
Gln	Glu	Leu	Leu	Leu	Ile	Leu	Asp	Glu	Tyr	Trp	Ala	Asn	His	Pro	Asp
			260					265					270		
Leu	His	Asn	Ile	Pro	Ile	Tyr	Tyr	Ala	Ser	Pro	Leu	Ala	Lys	Lys	Cys
			275				280					285			
Met	Ala	Val	Tyr	Gln	Thr	Tyr	Ile	Leu	Ser	Met	Asn	Asp	Arg	Ile	Arg
			290			295					300				
Asn	Gln	Phe	Ala	Asn	Ser	Asn	Pro	Phe	Val	Phe	Lys	His	Ile	Ser	Pro
305					310					315					320
Leu	Asn	Ser	Ile	Asp	Asp	Phe	Asn	Asp	Val	Gly	Pro	Ser	Val	Val	Met
				325					330					335	
Ala	Thr	Pro	Gly	Gly	Leu	Gln	Ser	Gly	Leu	Ser	Arg	Gln	Leu	Phe	Asp
				340				345					350		
Ser	Trp	Cys	Ser	Asp	Lys	Lys	Asn	Ala	Cys	Ile	Ile	Pro	Gly	Tyr	Met
							360					365			
Val	Glu	Gly	Thr	Leu	Ala	Lys	Thr	Ile	Ile	Asn	Glu	Pro	Lys	Glu	Val
						375					380				

[illegible]

[illegible]

Phe 305	Arg	Asp	Ser	Gln 310	Thr	Asn	Pro	Phe	Ile 315	Phe	Lys	Asn	Ile	Ser	Tyr 320
Leu	Arg	Asn	Leu	Glu 325	Asp	Phe	Gln	Asp	Phe 330	Gly	Pro	Ser	Val	Met 335	Leu
Ala	Ser	Pro	Gly 340	Met	Leu	Gln	Ser	Gly 345	Leu	Ser	Arg	Asp	Leu 350	Leu	Glu
Arg	Trp	Cys 355	Pro	Glu	Asp	Lys	Asn 360	Leu	Val	Leu	Ile	Thr 365	Gly	Tyr	Ser
Ile	Glu 370	Gly	Thr	Met	Ala	Lys 375	Phe	Ile	Met	Leu	Glu 380	Pro	Asp	Thr	Ile
Pro 385	Ser	Ile	Asn	Asn	Pro 390	Glu	Ile	Thr	Ile	Pro 395	Arg	Arg	Cys	Gln	Val 400
Glu	Glu	Ile	Ser	Phe 405	Ala	Ala	His	Val	Asp 410	Phe	Gln	Glu	Asn	Leu	Glu 415
Phe	Ile	Glu 420	Lys	Ile	Ser	Ala	Pro	Asn 425	Ile	Ile	Leu	Val	His 430	Gly	Glu
Ala	Asn	Pro 435	Met	Gly	Arg	Leu	Lys 440	Ser	Ala	Leu	Leu	Ser	Asn 445	Phe	Ala
Ser	Leu 450	Lys	Gly	Thr	Asp	Asn 455	Glu	Val	His	Val	Phe 460	Asn	Pro	Arg	Asn
Cys 465	Val	Glu	Val	Asp	Leu 470	Glu	Phe	Gln	Gly	Val 475	Lys	Val	Ala	Lys	Ala 480
Val	Gly	Asn	Ile	Val 485	Asn	Glu	Ile	Tyr	Lys 490	Glu	Glu	Asn	Val	Glu 495	Ile
Lys	Glu	Glu	Ile 500	Ala	Ala	Lys	Ile	Glu 505	Pro	Ile	Lys	Glu	Glu 510	Asn	Glu
Asp	Asn	Leu 515	Asp	Ser	Gln	Ala	Glu 520	Lys	Gly	Leu	Val	Asp 525	Glu	Glu	Glu
His 530	Lys	Asp	Ile	Val	Val	Ser 535	Gly	Ile	Leu	Val	Ser 540	Asp	Asp	Lys	Asn
Phe 545	Glu	Leu	Asp	Phe	Leu 550	Ser	Leu	Ser	Asp	Leu 555	Arg	Glu	His	His	Pro 560
Asp	Leu	Ser	Thr 565	Thr	Ile	Leu	Arg	Glu	Arg 570	Gln	Ser	Val	Arg	Val 575	Asn
Cys	Lys	Lys	Glu 580	Leu	Ile	Tyr	Trp	His 585	Ile	Leu	Gln	Met	Phe	Gly	Glu
Ala	Glu 595	Val	Leu	Gln	Asp	Asp	Arg	Val	Thr	Asn	Gln 605	Glu	Pro	Lys	
Val	Lys 610	Glu	Glu	Ser	Lys	Asp 615	Asn	Leu	Thr	Asn	Thr 620	Gly	Lys	Leu	Ile
Leu 625	Gln	Ile	Met	Gly 630	Asp	Ile	Lys	Leu	Thr	Ile 635	Val	Asn	Thr	Leu	Ala 640

Val Val Glu Trp Thr Gln Asp Leu Met Asn Asp Thr Val Ala Asp Ser
645 650 655

Ile Ile Ala Ile Leu Met Asn Val Asp Ser Ala Pro Ala Ser Val Lys
660 665 670

Leu Ser Ser His Ser Cys Asp Asp His Asp His Asn Asn Val Gln Ser
675 680 685

Asn Ala Gln Gly Lys Ile Asp Glu Val Glu Arg Val Lys Gln Ile Ser
690 695 700

Arg Leu Phe Lys Glu Gln Phe Gly Asp Cys Phe Thr Leu Phe Leu Asn
705 710 715 720

Lys Asp Glu Tyr Ala Ser Asn Lys Glu Glu Thr Ile Thr Gly Val Val
725 730 735

Thr Ile Gly Lys Ser Thr Ala Lys Ile Asp Phe Asn Asn Met Lys Ile
740 745 750

Leu Glu Cys Asn Ser Asn Pro Leu Lys Gly Arg Val Glu Ser Leu Leu
755 760 765

Asn Ile Gly Gly Asn Leu Val Thr Pro Leu Cys
770 775

<210> 236

<211> 554

<212> PRT

<213> Synechocystis sp.

<400> 236

Met Thr Phe Ser Val Pro Thr Gln Gly Lys Ala Phe Ala Asn Ile Ser
1 5 10 15

Phe Leu Pro Tyr Gly Val Gly Pro Arg Asp Gly Gly Ile Cys Leu Glu
20 25 30

Leu His Leu Gly Pro Tyr Arg Ile Leu Leu Asp Cys Gly Leu Glu Asp
35 40 45

Leu Thr Pro Leu Leu Ala Ala Asp Pro Gly Thr Val Asp Leu Val Phe
50 55 60

Cys Ser His Ala His Arg Asp His Gly Leu Gly Leu Trp Gln Phe His
65 70 75 80

Gln Gln Phe Pro His Ile Pro Ile Leu Ala Ser Glu Val Thr Gln Arg
85 90 95

Leu Leu Pro Leu Asn Trp Pro Asp Glu Phe Val Pro Pro Phe Cys Arg
100 105 110

Val Leu Pro Trp Arg Ser Pro Gln Glu Val Leu Pro Gly Leu Thr Val
115 120 125

Glu Leu Leu Pro Ala Gly His Leu Pro Gly Ala Ala Leu Ile Leu Leu
130 135 140

Glu Tyr His Asn Gly Asp Arg Leu Tyr Arg Val Ile Tyr Thr Gly Asp
145 150 155 160

Tyr	Cys	Leu	Ser	His	Leu	Gln	Leu	Val	Asp	Gly	Leu	Ala	Leu	Thr	Pro
				165					170					175	
Leu	Arg	Gly	Leu	Lys	Pro	Asp	Val	Leu	Ile	Leu	Glu	Gly	His	Tyr	Gly
			180					185					190		
Asn	Arg	Arg	Leu	Pro	His	Arg	Arg	Gln	Gln	Glu	Lys	Gln	Phe	Ile	Gln
			195				200					205			
Ala	Ile	Glu	Thr	Val	Leu	Ala	Lys	Gly	Arg	Asn	Ile	Leu	Leu	Pro	Val
			210			215					220				
Pro	Pro	Leu	Gly	Leu	Ala	Gln	Glu	Ile	Leu	Lys	Leu	Leu	Arg	Thr	His
				230						235					240
His	Gln	Phe	Thr	Gly	Arg	Gln	Val	Asn	Leu	Trp	Ala	Gly	Glu	Ser	Val
				245					250					255	
Ala	Arg	Gly	Cys	Asp	Ala	Tyr	Gln	Gly	Ile	Ile	Asp	His	Leu	Pro	Asp
			260					265					270		
Asn	Val	Arg	Asn	Phe	Ala	Gln	His	Gln	Pro	Leu	Phe	Trp	Asp	Asp	Lys
		275					280					285			
Val	Tyr	Pro	His	Leu	Arg	Pro	Leu	Thr	Asp	Asp	Gln	Gly	Glu	Leu	Ser
		290				295					300				
Leu	Ser	Ala	Pro	Ser	Ile	Val	Ile	Thr	Thr	Thr	Trp	Pro	Ala	Phe	Trp
					310					315					320
Pro	Ser	Pro	Ala	Ala	Leu	Pro	Gly	Leu	Trp	Thr	Val	Phe	Met	Pro	Gln
				325					330					335	
Leu	Leu	Thr	Leu	Pro	Ser	Cys	Leu	Val	Asn	Phe	Ala	Trp	Gln	Asp	Leu
			340					345					350		
Glu	Glu	Phe	Pro	Lys	Tyr	Glu	Leu	Glu	Asp	Tyr	Leu	Leu	Ala	Asp	His
			355				360					365			
Ser	Asp	Gly	Arg	Asn	Thr	Thr	Gln	Leu	Ile	His	Asn	Leu	Arg	Pro	Gln
						375					380				
His	Leu	Val	Phe	Val	His	Gly	Gln	Pro	Ser	Asp	Ile	Glu	Asp	Leu	Thr
					390					395					400
Ser	Leu	Glu	Glu	Leu	Gln	Ser	Arg	Tyr	Gln	Leu	His	Ser	Pro	Ala	Ala
				405					410					415	
Gly	Asn	Ala	Val	Ala	Leu	Pro	Ile	Gly	Asp	Arg	Phe	Val	Gln	Pro	Thr
				420				425					430		
Pro	Pro	Pro	Pro	Gln	Ile	Tyr	Glu	Gly	Glu	Ile	His	Glu	Leu	Glu	Pro
							440					445			
Asn	Lys	Gln	Ile	His	His	Leu	Gly	Glu	Val	Val	Ile	His	Leu	Asp	Gly
						455					460				
Gln	Ile	Leu	Glu	Asn	Ser	Arg	Trp	Gly	Lys	Phe	Gly	Glu	Thr	Gly	Ile
					470					475					480
Val	Gln	Ala	Arg	Trp	Gln	Gly	Glu	Glu	Leu	Val	Leu	Arg	Gly	Ile	Ser
				485					490					495	

Leu Asn Val Pro Glu Phe Thr Leu Asp Ser Leu Asp Ala Val Ile Il
225 230 235 24

Thr	His	Ala	His	Leu	Asp	His	Ser	Gly	Phe	Leu	Pro	Tyr	Leu	Tyr	His
			245						250					255	
Tyr	Gly	Tyr	Asp	Gly	Pro	Val	Tyr	Cys	Thr	Ala	Pro	Thr	Arg	Asp	Leu
			260					265					270		
Met	Thr	Leu	Leu	Gln	Leu	Asp	His	Ile	Asp	Ile	Ala	His	Arg	Glu	Asp
		275					280					285			
Glu	Pro	Leu	Pro	Phe	Asn	Val	Lys	His	Val	Lys	Lys	Ser	Val	Lys	His
		290				295					300				
Thr	Ile	Thr	Leu	Asp	Tyr	Gly	Glu	Val	Thr	Asp	Ile	Ala	Pro	Asp	Ile
305					310					315					320
Arg	Leu	Thr	Leu	His	Asn	Ala	Gly	His	Ile	Leu	Gly	Ser	Ala	Met	Ala
				325					330					335	
His	Leu	His	Ile	Gly	Asp	Gly	Gln	His	Asn	Met	Val	Tyr	Thr	Gly	Asp
			340					345					350		
Phe	Lys	Tyr	Glu	Gln	Ser	Arg	Leu	Glu	Ala	Ala	Ala	Asn	Arg	Phe	
		355					360				365				
Pro	Arg	Ile	Glu	Thr	Leu	Val	Met	Glu	Ser	Thr	Tyr	Gly	Gly	His	Glu
		370				375						380			
Asp	Val	Gln	Pro	Ser	Arg	Asn	Arg	Ala	Glu	Lys	Glu	Leu	Val	Lys	Thr
385					390					395					400
Ile	Tyr	Ser	Thr	Leu	Arg	Arg	Gly	Gly	Lys	Ile	Leu	Ile	Pro	Val	Phe
				405					410					415	
Ala	Val	Gly	Arg	Ala	Gln	Glu	Leu	Met	Ile	Val	Leu	Glu	Glu	Tyr	Ile
			420					425					430		
Arg	Thr	Gly	Ile	Ile	Asp	Glu	Val	Pro	Val	Tyr	Ile	Asp	Gly	Met	Ile
		435					440					445			
Trp	Glu	Ala	Asn	Ala	Ile	His	Thr	Ala	Arg	Pro	Glu	Tyr	Leu	Ser	Lys
		450				455					460				
Asp	Leu	Arg	Asp	Gln	Ile	Phe	His	Met	Gly	His	Asn	Pro	Phe	Ile	Ser
465					470					475					480
Asp	Ile	Phe	His	Lys	Val	Asn	Gly	Met	Asp	Glu	Arg	Arg	Glu	Ile	Val
				485					490					495	
Glu	Gly	Glu	Pro	Ser	Ile	Ile	Leu	Ser	Thr	Ser	Gly	Met	Leu	Thr	Gly
			500					505					510		
Gly	Asn	Ser	Leu	Glu	Tyr	Phe	Lys	Trp	Leu	Cys	Glu	Asp	Pro	Asp	Asn
			515					520				525			
Ser	Leu	Val	Phe	Val	Gly	Tyr	Gln	Ala	Glu	Gly	Ser	Leu	Gly	Arg	Arg
			530			535					540				
Ile	Gln	Lys	Gly	Trp	Lys	Glu	Ile	Pro	Leu	Lys	Asp	Glu	Asp	Asp	Lys
545					550					555					560
Met	Arg	Val	Tyr	Asn	Val	Arg	Met	Asn	Ile	Lys	Thr	Ile	Glu	Gly	Phe
				565					570					575	

Ser Asn Asp Pro Leu Leu Met Thr Gln Tyr Phe Lys Lys Ser Pro Ser
225 230 235 240

Leu Thr Glu Ala Ser Glu Lys Ile Ser Thr His Ile Gln Thr Ser Gln
 245 250 255
 Gln Ala Leu Gln Phe Thr Asp Phe Val Glu Asn Asp Lys Leu Val Gly
 260 265 270
 Val Ala Leu Arg Leu Ala Asn Asn Ser Glu His Ile Asn Leu Pro Leu
 275 280 285
 Pro Glu Asn Asp Phe Ser Asp Cys Glu Ile Ser Tyr Ser Pro Leu Gln
 290 295 300
 Ser Asp Glu Asp Thr His Asp Ile Asp Glu Lys Pro Asp Asp Ser Gln
 305 310 315 320
 Glu Gln Leu Phe Phe Thr Glu Ser Ser Lys Asp Gly Ser Leu Glu Glu
 325 330 335
 Asp Asp Asp Ser Cys Gly Phe Phe Lys Lys Arg His Gly Pro Leu Leu
 340 345 350
 Lys Asp Gln Asp Glu Ser Cys Pro Lys Val Asn Ser Phe Leu Thr Arg
 355 360 365
 Asp Lys Tyr Asp Glu Gly Leu Tyr Arg Phe Asn Ser Leu Asn Asp Leu
 370 375 380
 Ser Gln Pro Ile Ser Gln Asn Asn Glu Ser Thr Leu Pro Tyr Asp Leu
 385 390 395 400
 Ala Cys Thr Gly Gly Asp Phe Val Leu Phe Pro Pro Ala Leu Ala Gly
 405 410 415
 Lys Leu Ala Ala Ser Val His Gln Ala Thr Lys Ala Lys Pro Asp Glu
 420 425 430
 Pro Glu Phe His Ser Ala Gln Ser Asn Lys Gln Lys Gln Val Ile Glu
 435 440 445
 Glu Ser Ser Val Tyr Asn Gln Val Ser Leu Pro Leu Val Lys Ser Leu
 450 455 460
 Met Leu Lys Pro Phe Glu Ser Gln Val Glu Gly Tyr Leu Ser Ser Gln
 465 470 475 480
 Pro Thr Gln Asn Thr Ile Arg Lys Leu Ser Ser Glu Asn Leu Asn Ala
 485 490 495
 Lys Asn Asn Thr Asn Ser Ala Cys Phe Cys Arg Lys Ala Leu Glu Gly
 500 505 510
 Val Pro Val Gly Lys Ala Thr Ile Leu Asn Thr Glu Asn Leu Ser Ser
 515 520 525
 Thr Pro Ala Pro Lys Tyr Leu Lys Ile Leu Pro Ser Gly Leu Lys Tyr
 530 535 540
 Asn Ala Arg His Pro Ser Thr Lys Val Met Lys Gln Met Asp Ile Gly
 545 550 555 560
 Val Tyr Phe Gly Leu Pro Pro Lys Arg Lys Glu Glu Lys Leu Leu Gly
 565 570 575

Glu	Ser	Ala	Leu	Glu	Gly	Ile	Asn	Leu	Asn	Pro	Val	Pro	Ser	Pro	Asn
			580					585					590		
Gln	Lys	Arg	Ser	Ser	Gln	Cys	Lys	Arg	Lys	Ala	Glu	Lys	Ser	Leu	Ser
			595				600					605			
Asp	Leu	Glu	Phe	Asp	Ala	Ser	Thr	Leu	His	Glu	Ser	Gln	Leu	Ser	Val
			610			615					620				
Glu	Leu	Ser	Ser	Glu	Arg	Ser	Gln	Arg	Gln	Lys	Lys	Arg	Cys	Arg	Lys
				625		630				635					640
Ser	Asn	Ser	Leu	Gln	Glu	Gly	Ala	Cys	Gln	Lys	Arg	Ser	Asp	His	Leu
				645					650					655	
Ile	Asn	Thr	Glu	Ser	Glu	Ala	Val	Asn	Leu	Ser	Lys	Val	Lys	Val	Phe
			660					665					670		
Thr	Lys	Ser	Ala	His	Gly	Gly	Leu	Gln	Arg	Gly	Asn	Lys	Lys	Ile	Pro
			675				680					685			
Glu	Ser	Ser	Asn	Val	Gly	Gly	Ser	Arg	Lys	Lys	Thr	Cys	Pro	Phe	Tyr
			690			695					700				
Lys	Lys	Ile	Pro	Gly	Thr	Gly	Phe	Thr	Val	Asp	Ala	Phe	Gln	Tyr	Gly
				705		710				715					720
Val	Val	Glu	Gly	Cys	Thr	Ala	Tyr	Phe	Leu	Thr	His	Phe	His	Ser	Asp
				725					730					735	
His	Tyr	Ala	Gly	Leu	Ser	Lys	His	Phe	Thr	Phe	Pro	Val	Tyr	Cys	Ser
			740					745					750		
Glu	Ile	Thr	Gly	Asn	Leu	Leu	Lys	Asn	Lys	Leu	His	Val	Gln	Glu	Gln
		755					760					765			
Tyr	Ile	His	Pro	Leu	Pro	Leu	Asp	Thr	Glu	Cys	Ile	Val	Asn	Gly	Val
			770			775					780				
Lys	Val	Val	Leu	Leu	Asp	Ala	Asn	His	Cys	Pro	Gly	Ala	Val	Met	Ile
					790					795					800
Leu	Phe	Tyr	Leu	Pro	Asn	Gly	Thr	Val	Ile	Leu	His	Thr	Gly	Asp	Phe
				805					810					815	
Arg	Ala	Asp	Pro	Ser	Met	Glu	Arg	Ser	Leu	Leu	Ala	Asp	Gln	Lys	Val
			820					825					830		
His	Met	Leu	Tyr	Leu	Asp	Thr	Thr	Tyr	Cys	Ser	Pro	Glu	Tyr	Thr	Phe
			835				840					845			
Pro	Ser	Gln	Gln	Glu	Val	Ile	Arg	Phe	Ala	Ile	Asn	Thr	Ala	Phe	Glu
						855					860				
Ala	Val	Thr	Leu	Asn	Pro	His	Ala	Leu	Val	Val	Cys	Gly	Thr	Tyr	Ser
					870					875					880
Ile	Gly	Lys	Glu	Lys	Val	Phe	Leu	Ala	Ile	Ala	Asp	Val	Leu	Gly	Ser
				885					890						895
Lys	Val	Gly	Met	Ser	Gln	Glu	Lys	Tyr	Lys	Thr	Leu	Gln	Cys	Leu	Asn
			900					905					910		

Ile Pro Glu Ile Asn Ser Leu Ile Thr Thr Asp Met Cys Ser Ser Leu
915 920 925

Val His Leu Leu Pro Met Met Gln Ile Asn Phe Lys Gly Leu Gln Ser
930 935 940

His Leu Lys Lys Cys Gly Gly Lys Tyr Asn Gln Ile Leu Ala Phe Arg
945 950 955 960

Pro Thr Gly Trp Thr His Ser Asn Lys Phe Thr Arg Ile Ala Asp Val
965 970 975

Ile Pro Gln Thr Lys Gly Asn Ile Ser Ile Tyr Gly Ile Pro Tyr Ser
980 985 990

Glu His Ser Ser Tyr Leu Glu Met Lys Arg Phe Val Gln Trp Leu Lys
995 1000 1005

Pro Gln Lys Ile Ile Pro Thr Val Asn Val Gly Thr Trp Lys Ser Arg
1010 1015 1020

Ser Thr Met Glu Lys Tyr Phe Arg Glu Trp Lys Leu Glu Ala Gly Tyr
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<400> 239

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Ser Ser Gln Leu Ser Ile Arg Lys Pro Leu His Pro Thr Asn Ala Asn
20 25 30

Asn Ile Ser His Arg Pro Pro Asn Lys Lys Pro Arg Leu Cys Arg Tyr
35 40 45

Pro Gly Lys Glu Asn Val Thr Pro Pro Pro Ser Pro Asp Pro Asp Leu
50 55 60

Phe Cys Ser Ser Ser Thr Pro His Cys Ile Leu Asp Cys Ile Pro Ser
65 70 75 80

Ser Val Asp Cys Ser Leu Gly Asp Phe Asn Gly Pro Ile Ser Ser Leu
85 90 95

Gly Glu Glu Asp Lys Glu Asp Lys Asp Asp Cys Ile Lys Val Asn Arg
100 105 110

Glu Gly Tyr Lys Cys Asn Ser Met Glu Ala Arg Leu Leu Lys Ser Arg
115 120 125

Ile Cys Leu Gly Phe Asp Ser Gly Ile His Glu Asp Asp Glu Gly Phe
130 135 140

Val Glu Ser Asn Ser Glu Leu Asp Val Leu Ile Asn Leu Cys Ser Glu
145 150 155 160

Ser	Glu	Gly	Arg	Ser	Gly	Glu	Phe	Ser	Leu	Gly	Lys	Asp	Asp	Ser	Ile
			165						170					175	
Gln	Cys	Pro	Leu	Cys	Ser	Met	Asp	Ile	Ser	Ser	Leu	Ser	Glu	Glu	Gln
			180					185					190		
Arg	Gln	Val	His	Ser	Asn	Thr	Cys	Leu	Asp	Lys	Ser	Tyr	Asn	Gln	Pro
		195					200					205			
Ser	Glu	Gln	Asp	Ser	Leu	Arg	Lys	Cys	Glu	Asn	Leu	Ser	Ser	Leu	Ile
		210				215					220				
Lys	Glu	Ser	Ile	Asp	Asp	Pro	Val	Gln	Leu	Pro	Gln	Leu	Val	Thr	Asp
		225			230					235					240
Leu	Ser	Pro	Val	Leu	Lys	Trp	Leu	Arg	Ser	Leu	Gly	Leu	Ala	Lys	Tyr
			245					250						255	
Glu	Asp	Val	Phe	Ile	Arg	Glu	Glu	Ile	Asp	Trp	Asp	Thr	Leu	Gln	Ser
		260						265					270		
Leu	Thr	Glu	Glu	Asp	Leu	Leu	Ser	Ile	Gly	Ile	Thr	Ser	Leu	Gly	Pro
		275					280					285			
Arg	Lys	Lys	Ile	Val	Asn	Ala	Leu	Ser	Gly	Val	Arg	Asp	Pro	Phe	Ala
		290				295					300				
Ser	Ser	Ala	Glu	Val	Gln	Ala	Gln	Ser	His	Cys	Thr	Ser	Gly	His	Val
		305			310					315					320
Thr	Glu	Arg	Gln	Arg	Asp	Lys	Ser	Thr	Thr	Arg	Lys	Ala	Ser	Glu	Pro
			325						330					335	
Lys	Lys	Pro	Thr	Ala	Asn	Lys	Leu	Ile	Thr	Glu	Phe	Phe	Pro	Gly	Gln
			340					345					350		
Ala	Thr	Glu	Gly	Thr	Lys	Ile	Arg	Thr	Ala	Pro	Lys	Pro	Val	Ala	Glu
		355					360					365			
Lys	Ser	Pro	Ser	Asp	Ser	Ser	Ser	Arg	Arg	Ala	Val	Arg	Arg	Asn	Gly
		370				375					380				
Asn	Asn	Gly	Lys	Ser	Lys	Val	Ile	Pro	His	Trp	Asn	Cys	Ile	Pro	Gly
		385			390					395				400	
Thr	Pro	Phe	Arg	Val	Asp	Ala	Phe	Lys	Tyr	Leu	Thr	Arg	Asp	Cys	Cys
			405						410					415	
His	Trp	Phe	Leu	Thr	His	Phe	His	Leu	Asp	His	Tyr	Gln	Gly	Leu	Thr
		420						425					430		
Lys	Ser	Phe	Ser	His	Gly	Lys	Ile	Tyr	Cys	Ser	Leu	Val	Thr	Ala	Lys
		435					440					445			
Leu	Val	Asn	Met	Lys	Ile	Gly	Ile	Pro	Trp	Glu	Arg	Leu	Gln	Val	Leu
	450					455					460				
Asp	Leu	Gly	Gln	Lys	Val	Asn	Ile	Ser	Gly	Ile	Asp	Val	Thr	Cys	Phe
				470						475					480
Asp	Ala	Asn	His	Cys	Pro	Gly	Ser	Ile	Met	Ile	Leu	Phe	Glu	Pro	Ala
			485						490					495	

Asn Ile Pro Thr Ser Ser Asn Leu Pro Val Arg Ser Ser Ser Tyr Ser
50 55 60

Phe 65	Ser	Arg	Phe	Ser 70	Cys	Ser	Thr	Ser	Asn	Lys 75	Asn	Thr	Glu	Pro	Val 80
Ile	Ile	Asn	Asp	Asp 85	Asp	His	Asn	Ser	Ile 90	Cys	Leu	Glu	Asp	Thr 95	Ala
Lys	Val	Glu	Ile	Thr	Ile	Asp	Thr	Asp 105	Glu	Glu	Glu	Leu	Val 110	Ser	Leu
His	Asp	Asn	Glu	Val	Ser	Ala	Ile 120	Glu	Asn	Arg	Thr	Glu 125	Asp	Arg	Ile
Val	Thr	Glu	Leu	Glu	Glu	Gln 135	Val	Asn	Val	Lys 140	Val	Ser	Thr	Glu	Val
Ile	Gln	Cys	Pro	Ile	Cys 150	Leu	Glu	Asn	Leu	Ser 155	His	Leu	Glu	Leu	Tyr 160
Glu	Arg	Glu	Thr	His 165	Cys	Asp	Thr	Cys	Ile 170	Gly	Ser	Asp	Pro	Ser	Asn 175
Met	Gly	Thr	Pro 180	Lys	Lys	Asn	Ile	Arg 185	Ser	Phe	Ile	Ser	Asn 190	Pro	Ser
Ser	Pro	Ala 195	Lys	Thr	Lys	Arg	Asp 200	Ile	Ala	Thr	Ser	Lys 205	Lys	Pro	Thr
Arg	Val 210	Lys	Leu	Val	Leu	Pro 215	Ser	Phe	Lys	Ile 220	Lys	Phe	Asn	Asn	
Gly 225	His	Glu	Ile	Val	Val 230	Asp	Gly	Phe	Asn	Tyr 235	Lys	Ala	Ser	Glu	Thr 240
Ile	Ser	Gln	Tyr	Phe 245	Leu	Ser	His	Phe	His 250	Ser	Asp	His	Tyr	Ile 255	Gly
Leu	Lys	Lys	Ser 260	Trp	Asn	Asn	Pro	Asp 265	Glu	Asn	Pro	Ile	Lys 270	Lys	Thr
Leu	Tyr	Cys 275	Ser	Lys	Ile	Thr	Ala 280	Ile	Leu	Val	Asn	Leu 285	Lys	Phe	Lys
Ile	Pro 290	Met	Asp	Glu	Ile	Gln 295	Ile	Leu	Pro	Met	Asn 300	Lys	Arg	Phe	Trp
Ile	Thr	Asp	Thr	Ile	Ser 310	Val	Val	Thr	Leu	Asp 315	Ala	Asn	His	Cys	Pro 320
Gly	Ala	Ile	Ile	Met 325	Leu	Phe	Gln	Glu	Phe 330	Leu	Ala	Asn	Ser	Tyr 335	Asp
Lys	Pro	Ile	Arg 340	Gln	Ile	Leu	His	Thr 345	Gly	Asp	Phe	Arg	Ser	Asn	Ala
Lys	Met	Ile 355	Glu	Thr	Ile	Gln	Lys 360	Trp	Leu	Ala	Glu	Thr 365	Ala	Asn	Glu
Thr	Ile 370	Asp	Gln	Val	Tyr	Leu 375	Asp	Thr	Thr	Tyr	Met 380	Thr	Met	Gly	Tyr
Asn 385	Phe	Pro	Ser	Gln	His 390	Ser	Val	Cys	Glu	Thr 395	Val	Ala	Asp	Phe	Thr 400

[illegible]